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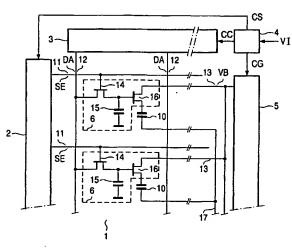
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Declaration under Rule 4.17:

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[Continued on next page]

(54) Title: DRIVING AN ACTIVE MATRIX DISPLAY



(57) Abstract: The active matrix display comprises a matrix of display pixels (10) which are associated with intersections of crossing select electrodes (11) and control electrodes (12). A select driver (2) supplies a select signal (SE) to the select electrodes (11). A control driver (3) supplies control signals (DA) to the control electrodes (12). A voltage level generator (5) supplies a plurality of different voltage levels (VBi) to level electrodes (13) of the active matrix display. The active matrix display further comprises select circuits (6) which are arranged to selectively couple the voltage levels (VBi) on the voltage level electrodes (13) to the pixels (10) to supply one of the plurality of different voltage levels (VBi) to a particular one of the pixels (10) in dependence on the select signal (SE) and the control signal (DA) associated with this particular pixel (10). The select signal (SE) indicates whether the particular pixel (10) is selected and the control signal (DA) indicates which one of said plurality of different voltage levels (VBi) has to be supplied to the particular one of the pixels (10) when selected.



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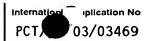
PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW, ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG)

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IN I ENNATIONAL SEARCH REPORT



A. CLASSIFICATION OF SUBJECT MATTER IPC 7 G09G3/34

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B. FIELDS SEARCHED

 $\begin{array}{ll} \mbox{Minimum documentation searched (classification system followed by classification symbols)} \\ \mbox{IPC 7} & \mbox{G09G} \end{array}$

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ

Y Further documents are listed in the continuation of box C.

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.	
X	EP 0 762 374 A (MOTOROLA INC) 12 March 1997 (1997-03-12) page 3, column 3, line 3 -column 4, line 43; figures 1,2 page 5, column 7, line 38 - line 49	1-3,7,8	
Υ	claims 1,2	6	
Y	US 4 833 464 A (DI SANTO FRANK J ET AL) 23 May 1989 (1989-05-23) cited in the application claims 1,2	6	
A	US 6 184 854 B1 (WETTIG ALAN D ET AL) 6 February 2001 (2001-02-06) cited in the application claims 1-3	1,7,8	
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Date of the actual completion of the international search 16 December 2003	Date of mailing of the international search report $22/12/2003$
Name and mailing address of the ISA European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Authorized officer Wanzeele, R

Patent family members are listed in annex.

INTERNATIONAL SEARCH REPORT



PCT 03/03469

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	C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT							
Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.						
Α	US 6 417 825 B1 (IPRI ALFRED C ET AL) 9 July 2002 (2002-07-09) abstract column 5, line 47 -column 6, line 34; figure 2	1,7,8						
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PCT U3/03469

Patent document cited in search report		Publication date		Patent family member(s)	Publication date
EP 0762374	Α	12-03-1997	US EP JP	5748160 A 0762374 A1 9138659 A	05-05-1998 12-03-1997 27-05-1997
US 4833464	Α	23-05-1989	NONE		
US 6184854	B1	06-02-2001	NONE		
US 6417825	B1	09-07-2002	WO	0019401 A1	06-04-2000